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UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
Forest Insect Laboratory
Berkeley, California

Project

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SUBJECT—

TITLE

INFESTATIONS OF THE RESIN MIDGE IN NATURAL REPRODUCTION

INDEX No.—

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MEMORANDUM FOR FILES

Re: Infestations of the Resin Midge in Natural Reproduction

Some observations of resin midge (Retinodiplosis sp.) infestations in pine forests have been made during the time the resin midge study was in progress at the Institute of Forest Genetics, at Placerville, California. These observations have been incidental to other work, and are therefore fragmentary. Now that it has been necessary to drop the study, this memorandum is written to record the scattered bits of information at hand.

Apparently all the infestations observed have been of the same species that is present at the Institute of Forest Genetics, for the type of injury and general habits of the insect have been the same in each instance. Distribution of the insect in the ponderosa pine forests of California is probably quite general. Infestations have been found in both west and east side stands as shown in the following list and on the map.

West Side
- American River Canyon
- Camino
- Placerville

East Side
- Antelope Creek
- Bartle
- Beiber
- Black's Mountain Experimental Forest
- Burney
- Dunsmuir
- Hackamore
- Hat Creek
- McArthur
- McCloud
- Weed
- Whitehorse
- Yreka

The distribution in any given stand was found to be quite irregular, particularly in the virgin forests. In some localized spots trees would be severely injured while a short distance away other trees would be uninfested. In cutover areas the infestations tended to be somewhat more regular, but still far from uniform.

The host species were the same as those attacked at the Institute of Forest Genetics, ponderosa and Jeffrey pine. The only infestation in the latter species was found at Black's Mountain in mixed stands of ponderosa and Jeffrey pines. Young trees 4 to 16 feet in height were noted to be most heavily attacked. In the east side forests some infestations have been seen in mature and overmature trees, but the attack was usually confined to the lower crown, rarely extending over 40 feet above the ground.

In none of the infestations was there any evidence that the resin midge makes any selection between vigorous or slow growing trees. Slow growing trees, however, are apparently more adversely affected than vigorous ones. In the fringe stands along the Pit River, the presence of only 2 or 3 larvae on a tip frequently caused a flag, whereas in the better sites near Burney Mountain tips with twice that infestation were not killed. The insect apparently does prefer the trees that secrete a sticky substance on the surface of the new shoot growth, for all the infested trees examined in the spring carried the exudate. These observations agree with those made at the Institute of Forest Genetics. There it was found that the resin midge made no selection as to vigor of the host trees, but did prefer the trees that carried the sticky substance on the shoots.

The type of injury was, in all cases, the same as that in the plantation at Placerville. The larvae feed in the phloem of the new shoots causing distortion of the affected shoots, and frequently killing the tip. The most severe injury was found in areas that had been clear cut and fairly well restocked. In this abundance of trees in the preferred age class the resin midge apparently can build up more rapidly than can its natural enemies. Eventually, however, the parasites begin to catch up. In the infestation near McCloud, natural enemies after several years seem to have been responsible for checking the resin midge. Rearing collections made last season indicate that the incidence of parasitism is now somewhat above 50 percent. The principal species present is Platygaster diplosidis (Asm.), the same one that predominates at the Institute of Forest Genetics.

The economic importance of the resin midge in California forests is not great at the present time. As the virgin stands of ponderosa pine are cut and the emphasis is placed more and more on the growing of a second timber crop the role of the insect will change. With the forests composed predominately of younger trees, resin midge injury will, no doubt, become more important. While resin midge injury rarely kills trees, extensive killing of branch and leader terminals over a period of years will sharply reduce growth rate and appreciably extend the time of harvest of the crop. It is also possible that the distortion and scarring resulting from resin midge may, to some extent, reduce the quality of the saw logs in the mature tree.

Direct control of the resin midge in forest reproduction, at least at present, is not economically practical, nor is biological control. When the time comes that a means of control is required, the best solution will probably be in the development of stands composed of resistant trees. If the unattractive, non-sticky character of the shoots can be combined with desirable characters of vigor, form, etc., it may be possible to develop a planting stock that is not susceptible to resin midge attack. In areas where restocking is by natural reproduction, it may prove feasible to select "non-sticky" leave trees, and, in subsequent thinning of the reproduction, to remove as many as possible of the "sticky", or susceptible, trees.

Respectfully submitted,

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Berkeley, California
May 6, 1942

KLAMATH R.
YREKA
ALTURAS
PIT R.
EAGLE LAKE
EUREKA
EEL R.
WEAVERVILLE
REDDING
SUSANVILLE
LAKE ALMANOR
RED BLUFF
QUINCY
SACRAMENTO R.
FEATHER R.
YUBA R.
BEAR R.
LAKE CAMEO
CLEAR LAKE
AMERICAN R.
PLACERVILLE
RUSSIAN R.
SACRAMENTO
MOKELUMNE R.
CALAVERAS R.
STANISLAUS R.
BERKELEY
OAKLAND
SAN FRANCISCO
MERCED R.
MERCED
BISHOP
MADERA
SAN JOAQUIN R.
MONTEREY
SALINAS R.
BAKERSFIELD
SANTA MARIA R.
BARSTOW
SANTA YNEZ R.
SANTA BARBARA
SANTA CLARA R.